

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present invention relates to a method for measuring the wettability of rock samples by measuring the relaxation time by low-field nuclear magnetic resonance.

Description of the Prior Art

[0002] There are well-known methods for determining the wettability of rocks to contained water and oil, comprising carrying out rock drainage cycles, that is displacement of fluids intended to decrease the water saturation, followed by imbibition. Imbibition relates to a displacement of fluids allowing an increase in the water saturation (S_w) of the rock. The capillary pressure P_c at one point is defined as the difference at equilibrium between the pressure $P(\text{oil})$ of the oil and the pressure $P(\text{water})$ of the water. This parameter is useful only if the two fluids are in the continuous phase in the porous medium. For a water wet medium, only the positive values are useful. On the other hand, when the medium has a mixed wettability, the fluids can remain in the continuous phase for the positive as well as for the negative capillary pressures (P_c).

[0003] For an application of this type, a complete capillary pressure measuring cycle generally comprises (Fig.1) :

- a) positive primary drainage of an initially 100 % water-saturated sample (curve 1) ;